

REMARKS

This responds to the Office Action mailed on March 2, 2007.

Claims 1, 2, 10, 14, 15, 25, 26, and 28-30 are amended and claim 5 has been cancelled; as a result, claims 1-4 and 6-30 are pending in this application upon entry of this amendment.

Supplemental Information Disclosure Statement

Applicants submitted a Supplemental Information Disclosure Statement and a 1449 Form on May 11, 2005. Applicants received the 1449 Form from the Examiner, with all but four of the listed documents initialed as being considered. The documents that were not initialed are the four foreign patents: Smart et al. (WO 01/99362A2), Choi (WO 03/061204A1), Terry et al. (WO 2005/004500A2) and Maltsev et al. (WO 2005/034435A2). Accordingly, Applicants respectfully requests that a complete initialed copy of the 1449 Form be returned to Applicants' Representatives to indicate that the cited documents have been considered by the Examiner.

Request for PTO-892 Form

The PTO-892 form with the office action failed to include the Thompson reference, cited below. Applicants request that the Examiner provide a PTO-892 with the Thompson reference.

Objection to the Specification

The Abstract was objected to because the language should be clear and concise, and should not repeat information given in the title. The Abstract page has been amended to delete the title.

§101 Rejection of the Claims

Claims 28-30 were rejected under 35 USC § 101 because the claimed invention is directed to non-statutory subject matter. Claims 28 – 30 have been amended to recite an article of manufacture, which is statutory subject matter.

§102 Rejection of the Claims

Claims 1, 2, 5-10, 14, 15, 18, 25, 28 and 30 were rejected under 35 USC § 102(e) as being anticipated by Kadous et al. (U.S. 6,654,408 B1).

Applicants' claim 1, as amended, is directed to a method that recites detecting a plurality of orthogonal frequency division multiplexed (OFDM) subchannels comprising symbol-modulated subcarriers to generate a channelization vector indicating which of the subchannels are active and which of the subchannels are inactive. As further recited in claim 1, data-symbol processing is performed on the active subchannels in response to the channelization vector to generate a bit stream from combined contributions of the active subchannels. Data-symbol processing is refrained from being performed on the inactive of the subchannels in response to the channelization vector. Applicants' claim 1 further recites that each subchannel comprises a group of adjacent OFDM subcarriers. Applicants' claims 14, 28, and 26 have similar recitations.

The channelization vector indicates which of the *subchannels* are active and which of the *subchannels* are inactive. Applicants' claim 1 further recites that each *subchannel* comprises a group of *adjacent subcarriers*.

Support for this amendment can be found in Applicants' specification. For example, Applicants' FIG. 6 illustrates that subchannels are separated in frequency from other subchannels, that some subchannels may be inactive, and that some subchannels may be active. Applicants' FIG. 6 illustrates four subchannels that may comprise a wideband channel. According to Applicants' claim 1, each subchannel may comprise *adjacent* subcarriers. Accordingly, inactive subcarriers are not interspersed with active subcarriers.

The distinction between active subchannels in Applicants' claims, and active subcarriers, as described in Kadous is essential. Kadous teaches that active subcarriers are either separated in frequency by $1/T$ or $2/T$. When separated by $2/T$, the active subcarriers have inactive subcarriers "between the frequencies of the active subcarriers" (see Kadous column 3, lines 41 - 53). Applicants submit that Kadous requires that inactive subcarriers be provided between the frequencies of the active subcarriers "to improve the accuracy of the data provided ... at the cost of higher complexity" (see Kadous column 3, lines 51 - 53). Accordingly, Applicants submit that Kadous teaches away from the use of a *group of adjacent inactive subcarriers* that define an inactive channel.

Applicants' claim 1 further distinguishes over Kadous by reciting that the subchannels are OFDM subchannels. In OFDM, each subcarrier is orthogonal with the other subcarriers, but overlaps with other subcarriers. Furthermore, in OFDM, each subcarrier may be modulated with different symbol information. This is emphasized in Applicants' claim 11, for example. In Kadous, on the other hand, each subcarrier carries the *same* information bit, which is spread to occupy the entire bandwidth (see Kadous column 4, lines 59 - 65). Therefore, Kadous combines the contributions from each subcarrier when decoding the received signal. In OFDM, at transmission separate information symbols are modulated on each subcarrier, which are demapped in the receiver (e.g., by demapper 318 Fig. 3).

Applicants' claim 1, on the other hand, recites the use of different subchannels. There is no requirement that the subchannels convey the same information, although it is possible. Applicants' claims 2 and 15, for example, may relate to a situation in which different information may be conveyed on each active subchannel and recites that the bit streams from the different active subchannels are multiplexed together to generate an output decoded bit stream. If the subchannels convey the same data, the contributions from the subchannels may be combined.

Applicants further submit that Kadous does not teach the generation and use of a channelization vector, as recited by Applicants' claim 1. In Applicants' claims, the receiver may not know beforehand what subchannels are active and what subchannels are inactive. In the case of four subchannels that make up a wideband channel, three subchannels may be inactive, and one may be active. The channelization vector may indicate which subchannels are active, and which subchannels are inactive. As recited in claim 1, the channelization vector is actually determined by the received signals.

The Examiner states that Kadous inherently teaches generating a channelization vector, however Applicants respectfully disagrees. Kadous uses different processing techniques to modulate inactive and active *subcarriers*, and to demodulate inactive and active *subcarriers*. Kadous attempts to capture the leakage of information between the different *subcarriers* and uses the reference designator 'K' to distinguish between even and odd subcarriers (see Kadous column 8 line 29 through column 9, line 21). Since Kadous uses alternating even and odd subcarriers as inactive and inactive subcarriers, there is no need in Kadous to generate a channelization vector. Furthermore, because individual subcarriers are very closely spaced, it

would be difficult, if not impossible, to determine which subcarriers actually are being used by their energy level. Kadous simply processes the subcarriers in accordance with Equation 11 (see Kadous column 8, line 45) to capture ‘information leakage (see Kadous column 9, lines 8 – 9).

Because Kadous has no need for a channelization vector, nor can Kadous generate a channelization vector as recited in Applicants’ claim 1, Kadous cannot inherently generate a channelization vector, and there would be no motivation to combine Kadous with any other reference to result in the recitations of Applicants’ claim 1.

In view of the above, Applicants submits that claim 1 is allowable over the cited references. Applicants further submit that claims 14, 25, and 28 are also allowable for similar reasons.

§103 Rejection of the Claims

Claims 3, 4, 16 and 29 were rejected under 35 USC § 103(a) as being unpatentable over Kadous et al. in view of Song et al. (U.S. 2004/0202138 A1).

Song has been cited by the Examiner for detecting subchannels with matched filters. Songs matched filters, however, are chip-matched filters each having the *same frequency response* (see Song FIG. 2). In Applicants’ claims, each matched filter is associated with a different subchannel, which covers a different frequency spectrum. This is emphasized in Applicants’ claim 4, which recites that the match filters have coefficient spectrum matches to a corresponding one of the subchannels. Song’s filters 90 – 92 are matched to a chip-rate, not a frequency of a subchannel (see Song page 3, paragraph [0068]). Applicants submit further that Song is directed to DS CDMA and would not be suitable for use with OFDM signals.

Claim 11 was also rejected under 35 USC § 103(a) as being unpatentable over Kadous et al. in view of Thomson et al. (U.S. 2003/0058951 A1). Thompson has been cited by the Examiner for receiving a sequence of short training symbols. The combination of Kadous and Thompson fail to disclose the elements of Applicants’ claim 1. The PTO-892 form with the office action failed to include the Thompson reference. Applicants request that the Examiner provide a PTO-892 with the Thompson reference.

Claim 12 was also rejected under 35 USC § 103(a) as being unpatentable over Kadous et al. in view of Stuber et al. (U.S. 2003/0076777 A1). Stuber has been cited by the Examiner for

disclosing synchronized data streams on active subchannels preceded by a preamble. The combination of Kadous and Stuber fail to disclose the elements of Applicants' claim 1, and further, fail to disclose the generation of a channelization vector from the preamble. In Stuber, there is no determination of which MIMO channels are active from the preambles.

Claims 13 and 19-24 were also rejected under 35 USC § 103(a) as being unpatentable over Kadous et al. in view of Walton et al. (U.S. 2006/0274844 A1). Walton has been cited from disclosing sending a request to a transmitter to refrain from transmitting on a subchannel that has poor channel conditions. The combination of Kadous and Walton fail to disclose the elements of Applicants' claim 13 and 19 - 24.

Allowable Subject Matter

Claim 26 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 26 has been rewritten in independent form including all of the limitations of the base claim 25. Accordingly, claim 26 is believed to be in condition for allowance.

Conclusion

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney ((480) 659-3314) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Reservation of Rights

In the interest of clarity and brevity, Applicants may not have addressed every assertion made in the Office Action. Applicants' silence regarding any such assertion does not constitute any admission or acquiescence. Applicants reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or

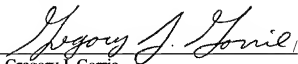
legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicants do not admit that any of the cited references or any other references of record is relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicants timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicants reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

Respectfully submitted,

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